

Monday, November 7

- Please pass in both of your graphing assignments.....last day to pass both in will be tomorrow
- Today, we will learn 5 new vocabulary terms.....please pay attention!
- Notes/Examples
- Practice Questions

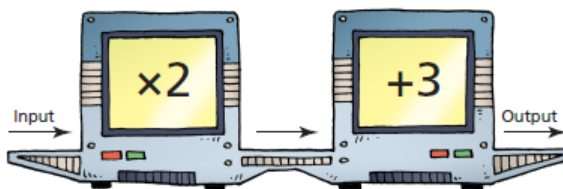
Extra help today and tomorrow at lunch!

5.2 Properties of Functions

LESSON FOCUS

Develop the concept of a function.

Make Connections



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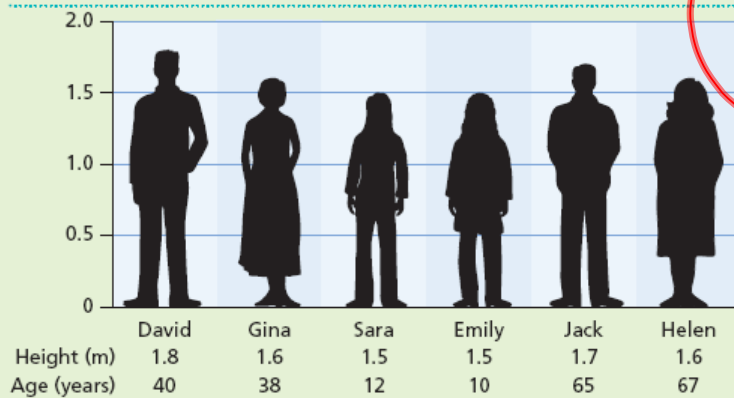
Input	Output
1	5
2	7
	9
4	
	13

← ✓

What is the rule for the Input/Output machine above?

Which numbers would complete this table for the machine?

THINK ABOUT IT



Work in a group of 3. Use the picture above.

Each of you chooses one of the relations below.

- name related to age
- name related to height
- height related to name

Represent the relation you chose. Compare the relations.

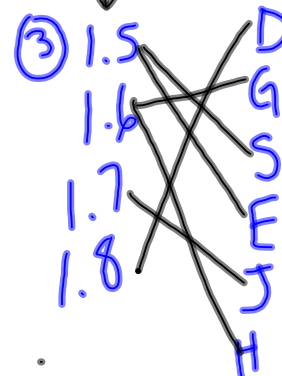
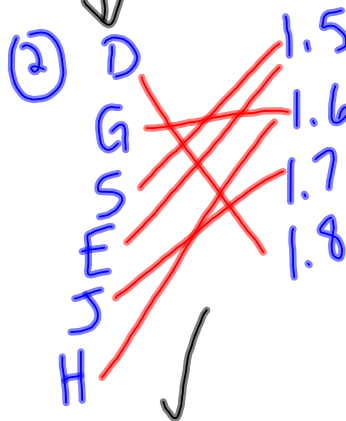
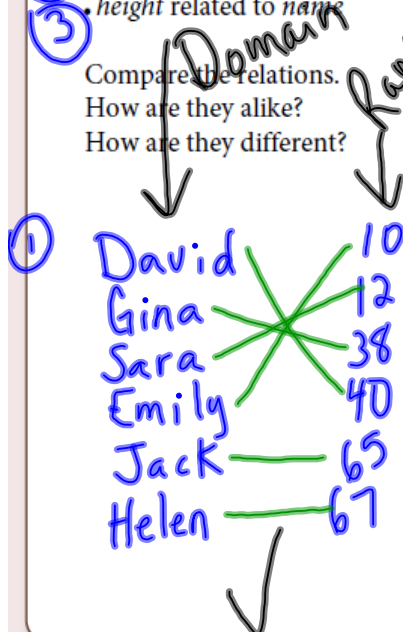
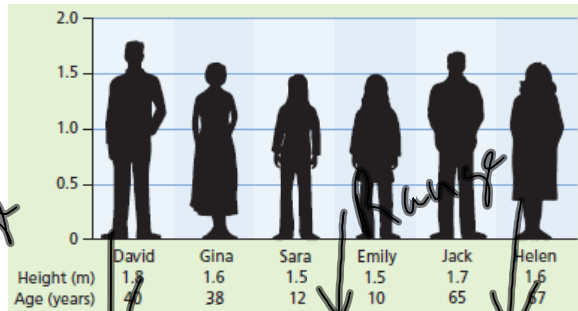
How are they alike? How are they different?

5.2 Properties of Functions

Represent each relation.

- ① name related to age
- ② name related to height
- ③ height related to name

Compare the relations.
How are they alike?
How are they different?



5.2 Properties of Functions

Relation between

① name and age.

David — 40
Gina — 38
Sara — 12
Emily — 10
Jack — 65
Helen — 67

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② name and height

D — 1.5
G — 1.6
S — 1.7
E — 1.8
J —
H —

③ height and name

1.5 — D
1.6 — G
1.7 — S
1.8 — E
J —
H —

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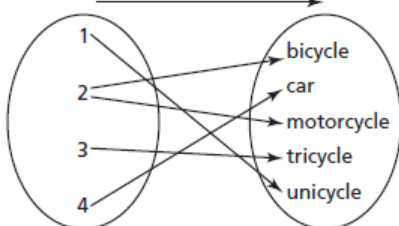
The set of first elements of a relation is called the **domain**.

The set of related second elements of a relation is called the **range**.

A **function** is a special type of relation where each element in the domain is associated with exactly one element in the range.

This relation associates a number with a vehicle with that number of wheels.

is the number of wheels on a



?

$\{(1, \text{unicycle}), (2, \text{bicycle}), (2, \text{motorcycle}), (3, \text{tricycle}), (4, \text{car})\}$

?

The domain is ?

The range is ?

Domain & Range:

Domain - set of all possible x values

Range - set of all possible y values

- When writing domain and range in set notation they should be written in order of smallest to largest. Numbers should not be repeated.

What is the domain for the following ordered pairs? What is the range?

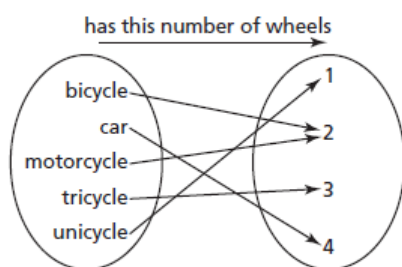
Example 1 $(5,6)$ $(8,9)$ $(3,4)$ $(10,11)$ $(2,1)$ $(8,1)$

Domain = 2, 3, 5, 8, 10

Range = 1, 4, 6, 9, 11

Function? No $\rightarrow (8,9)$ $(8,1)$ Same x-value has two y-values

This relation associates a vehicle with the number of wheels it has.



$\{(unicycle, 1), (bicycle, 2), (motorcycle, 2), (tricycle, 3), (car, 4)\}$

?

The domain is ?

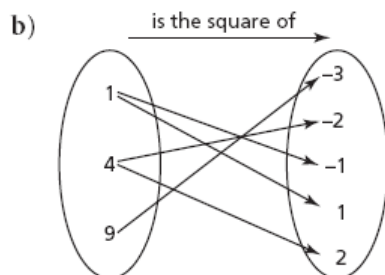
The range is ?

Example 1 Identifying Functions

For each relation below:

- Determine whether the relation is a function. Justify the answer.
- Identify the domain and range of each relation that is a function.

a) A relation that associates given shapes with the number of right angles in the shape: $\{(\text{right triangle}, 1), (\text{acute triangle}, 0), (\text{square}, 4), (\text{rectangle}, 4), (\text{regular hexagon}, 0)\}$



SOLUTION



CHECK YOUR UNDERSTANDING



5.2 Properties of Functions

In the workplace, a person's gross pay, P dollars, often depends on the number of hours worked, h .

So, we say P is the ?

Since the number of hours worked, h , does not depend on the gross pay, P , we say that h is the ?

Hours Worked, h	Gross Pay, P (\$)
1	12
2	24
3	36
4	48
5	60

The values of the independent variable are listed in the first column of a table of values. These elements belong to the ?

The values of the dependent variable are listed in the second column of a table of values. These elements belong to the ?

5.2 Properties of Functions



Cause-and-effect relationships

- When a change to one variable causes a change in another variable.

Variables: any measured quantity that changes in an experiment or relationship.

There are three types of variables:

1) **independent variable:** a factor or factors that affect another factor in an experiment or relationship, it is the cause which affects an outcome. Ex: rainfall, vehicle traffic, etc. (x-axis)

2) **dependant variable:** is the factor that is affected by other factors in an experiment or relationship, it is the effect which occurs after particular factors are presented Ex: the amount of tree growth. (y-axis)

3) **controlled variable:** any independent variable whose value is held constant during an experiment.

Example: Smoking and Lung Cancer
Example: hours worked and income